Taking Responsibility for All Soft Plastic Waste in Hospital Pharmacies (TRASH)

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Introduction

- Pharmaceutical packaging works to protect medication and provide information regarding the products contained within.
- Single use plastics have become a mainstay in the healthcare sector due to their versatility, ability provide a sterile environment, and cost effectiveness.
- The amount of plastic packaging materials has grown considerably in recent years, due to waste disposal challenges and increased demand during the COVID-19 pandemic.
- Current disposal methods include incineration, recycling, landfills, and re-use.
- A 2017 study within the Lower Mainland Health Authorities analyzed the material and energy waste from operations in hospital pharmacy departments. Gaps and challenges in current practice were identified, along with the specific need to focus on reducing packaging waste in pharmacies.
- Currently in Island Health, soft plastic recycling is not available at all locations.

Study Objectives

- Identify the types of soft plastic waste produced and methods for disposal at all Island Health pharmacy sites.
- Identify waste diversion challenges and existing good practices within the pharmacy and Environmental Support Services (ESS) departments.
- Recommend strategies to reduce our environmental footprint, while maintaining medication safety and infection control standards.
- Quantify the amount of plastic unit dose waste produced from an "average" patient at Cowichan District Hospital (CDH) and Cairnsmore Place LTC & extrapolate this to the yearly amounts produced.

Methods

- Survey-based study. Data was collected between January-April 2023 from the following sources:

Pharmacy Department	Environmental Support Services Department	Unit Dose Manufacturers

• 12 tertiary and community hospitals within Island Health that have an in-patient pharmacy on site.
• 16 item questionnaire answered during site visits or virtual meetings.
	• Contacted a contract & business initiatives manager who answered on behalf of the ESS department.
	• 6 item questionnaire obtained over email correspondence.
		• Contacted:
		  • ARxIUM (Automed)
		  • McKesson (PACMED)
		• 2 item questionnaire obtained over email correspondence.

Figure 1. Survey Participants and Methods

- Data was also obtained from (1) a point prevalence survey at CDH and Cairnsmore Place, and (2) CDH's 2021/22 Acute Care Facility Profile which were used to estimate:
  - The amount of unit dose plastic produced (1) in an average patient stay and (2) in one year at CDH and Cairnsmore Place LTC.

Results

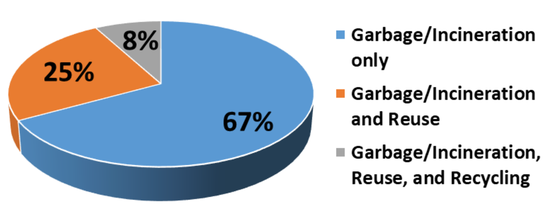

Figure 2. Waste disposal methods used for soft plastics at Island Health pharmacy sites expressed as a percentage.

Results

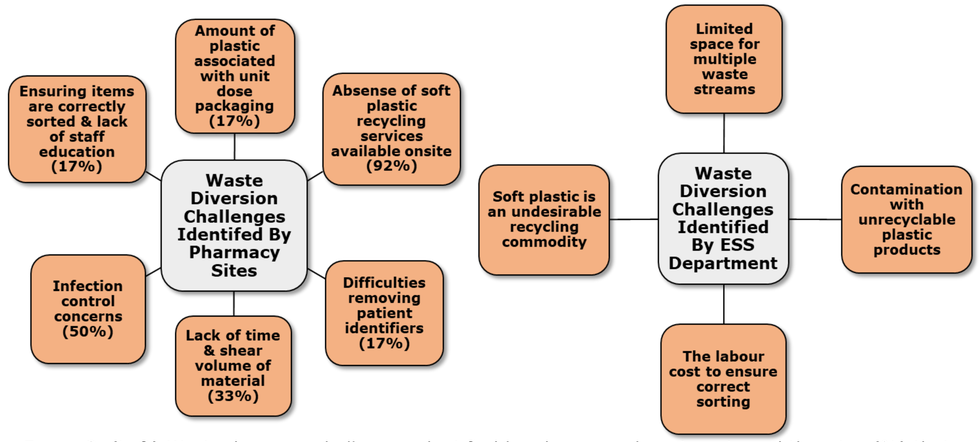

Figure 3. (Left) Waste diversion challenges identified by pharmacy departments and the sites (%) that identified each challenge as a concern. (Right) Waste diversion challenges identified by the ESS department.

Table 2. Pharmacy soft plastic waste items & opportunities to reduce environmental footprint.

Soft Plastic Waste	Waste Management Recommendations
Applicable to all items	• Engage with housekeeping to explore ways of bringing soft plastic recycling on site → starting with sites that already recycle soft plastic (Victoria General Hospital and Cumberland Health Center). • Engage with stakeholders to ensure the selection of recyclable soft plastic options are a priority over unrecyclable options.
Ziploc bags	• Ziploc bags should be returned to pharmacy departments for reuse if in appropriate condition. • Paper bags should be used in the place of Ziploc bags when able to. • Ziploc bags should disposed of in pharmaceutical waste buckets (incinerated) vs. being placed in the garbage, if recycling is not an option. • If a single unit dose is being dispensed, place label directly on unit dose overwrap as a flag instead of putting unit dose in Ziploc bag with the label on top. • Use re-usable bins to transport medications when able to instead of large Ziploc bags.
PACMED and Automed unit dose overwrap	• Engage with manufactures regarding eco-friendly packaging options. • Unit dose overwrap should incinerated vs. being placed in the garbage. • An environmental stewardship pharmacy technician could be assigned the duty of removing labels with patient identifiers from recyclable soft plastics. • Use of automated dispensing cabinets eliminates he need for patient specific labels.
Syringe wrapping	• See first row
Bubble wrap	• See first row
Plastic wrap (over boxes/bins)	• See first row

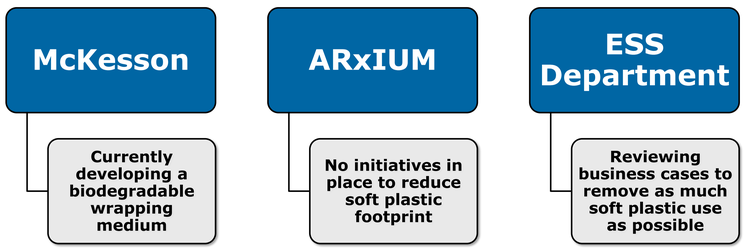

Figure 4. Initiatives by the ESS department at Island Health and unit dose manufacturers to reduce soft plastic use

Results (continued)

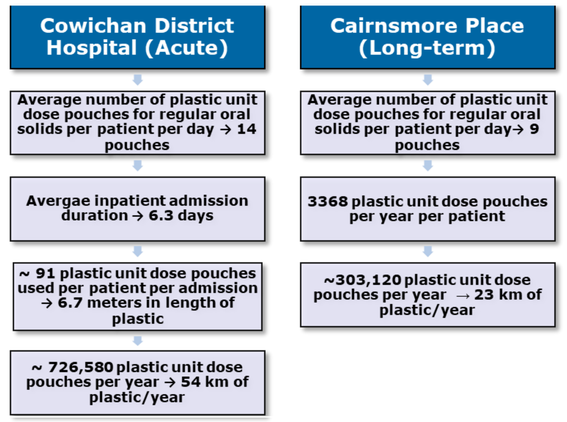

Figure 5. Amount of unit dose plastic produced by an average patient at CDH and Cairnsmore Place LTC & extrapolated amounts of unit dose plastic produced in one year.

Discussion

- The most prevalent waste diversion challenge identified from pharmacy sites was the absence of soft plastic recycling services at all Island Health pharmacy sites. Most staff members seemed willing to take the extra step of sorting and removing patient identifiers, however, were discouraged that items are not recycled onsite.
- The ESS department currently only recycles two specific soft plastic laundry items at Victoria General Hospital and Cumberland Health Centre due to the barriers listed in Figure 3.
- The composition of plastic waste items determines their recyclability. Plastic polymers must be separated and recycled individually, mixed plastic polymer products are not accepted. Ziploc bags, bubble wrap, and plastic wrap used over boxes and bins are single polymer products. PACMED and Automed unit dose overwrap and syringe wrappings are mixed polymers products.
- Infection control concern was the second most prevalent waste diversion challenge. As long as medications are not cytotoxic and patient identifiers can be removed, there are no protocols prohibiting the re-use of soft plastic items like Ziploc bags.
- In order to reduce soft plastic use, refusal at a procurement level or using more environmentally friendly alternatives should be the focus, with recycling and reuse as alternatives, followed by incineration, then disposal to landfills.
- Incineration is not a "fix-all" solution without consequences, however, the "Ocean Plastics Charter", signed by G7 members Canada, France, Germany, Italy and the UK aims to eliminate plastic from landfills and allows for "waste-to-energy" incineration.
- The creation of an environmental stewardship pharmacy technician would help implement our solutions without taking time away from existing pharmacy dispensary staff or require the ESS department to hire additional employees for sorting. Proposed roles include (1) removing patient information from recyclable items (2) ensuring items are correctly sorted into recycling bins, (3) liaising with the ESS department regarding environmental sustainability in the pharmacy department, and (4) returning unused medication to stock if appropriate.
- **Limitations include:**
  - Virtual meetings for sites outside Victoria (no funding for travel).
  - Survey responses dependent on motivation, honesty, and memory.
  - The use of point prevalence to measure the amount of unit dose plastic pouches produced.

Conclusion/Next Steps

- This study brings light to the significant amount and types of soft plastic waste produced yearly in the Island Health pharmacy sites. However, it also shows the willingness of staff members to make positive changes and highlights the good practices already in place to reduce our environmental footprint.
- Moving forward, fostering communication and positive relations between the Island Health ESS and pharmacy departments is essential.

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References available on request